

REMARKS

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Claims 4-9 and 13-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art of the instant disclosure in view of Giraud et al. and Okamoto.

The office action and references again relied upon have been carefully considered. In order to more clearly define the claimed invention over the prior art the claims have been amended so that claim 17 is the independent claim from which claim 6-9, and 13-16 claims depend. The limitations of cancelled claims 4 and 5 being have been included in independent claims 17 and 18.

Amended independent claims 17 and 18 describe the invention whereby:

1. The metal products 2 for reheating are continually moved in a reheat furnace as particularly described on page 8, lines 4 and 5 of the specification;
2. The hot point of the burner flames in the reheat furnace are reduced; and
3. There is a reduction of pressure variations, not only in the furnace, but also in the circuits for feeding the burners with fuel and oxidizer as described on page 12 of the specification in lines 28, 29 and 34-36.

An important distinction of the present invention is the limitation that the metal products move through the reheat furnace continuously. It is also important to note that the ignition order of the burners takes into consideration the fact that the products are moved through the furnace continuously.

In each section of the furnace the ignition order of the burners takes into account the thermal state of the product in the sections situated upstream of a particular section in order to adapt the heat needed for each particular product. Therefore, the average temperature and the temperature homogeneity of each product can vary according to the position of a charge, its characteristics, its progress along the length of the furnace, and temperature distribution objectives sought for the product.

The position of each product in the furnace is constantly taken into account to choose the ignition order of the burners.

The roller located downstream of the furnace is taken into consideration for controlling burner ignition. Factors including roller speed, stoppage, and progress through the furnace will modify optimal ignition.

Furthermore, the equipment situated upstream of the furnace has an impact on speed and temperature of the products in the furnace. The control process of the burners allows adjustments to the ignition order for taking into account fluctuations of these parameters.

The ignition order is an important consideration of the invention. The claims require: choosing the order of ignition of the burners to -

a) promote swirling and circulation of the flue gases so as to reduce a hot point of the flame and to obtain a better temperature homogeneity of walls of the furnace and of the products; and

b) reduce the pressure variations in the furnace and in circuits for feeding the burners with fuel and oxidizer

wherein burners are started and stopped for modifying the circulations of the flue gases in an enclosure of the furnace by a computer using mathematical control algorithms based on a thermal objective defined for the product; and

wherein the computer controls thermal distribution selectively in accordance with longitudinal and/or transverse curves of temperature of the furnace, as a function of the position

of a charge, of its characteristics and of its progress along the length of the furnace and of the temperature and exit temperature distribution objective sought for the product.

The distinctions of the cited prior art and the invention were discussed by the applicant in the previous amendment. However, two salient points must be considered. Okamoto (US 4,480,992) concerns the heating of a statically situated produce that is not moved in the furnace. The teachings of Okamoto doesn't pertain to the problems solved by the present invention as explored in the summary of the invention in the specification and reflected in the amended claims which addresses products that are continuously moved through a furnace.

The reduction of the flame hot point according to the invention is a great advantageous to achieving homogenous heating of continuously moving metal products in a furnace.

Girard (US 6, 334, 770) only teaches the use of a spread flame lateral burner. The substitution of the Girard burners in the static configuration of Okamoto would still not result in a furnace capable of correctly treating products being continuously moved through a furnace.

It is important to note that neither Okamoto, nor Girard take into account the problem and solution of flame hot point and pressure variations in the circuits for feeding the burners with fuel and oxidizer.

Accordingly, the combination of limitations in the amended claims avoids the cited prior art and should be allowed.

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to CBLH Deposit Account No. 22-0185, under Order No. 21029-00304-US1 from which the undersigned is authorized to draw.

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Respectfully submitted,

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